EFFECT OF OIL MASSAGE THERAPY TO LOW BIRTH WEIGHT INFANTS AT SRI RAMAKRISHNA HOSPITAL, COIMBATORE.

REG. NO. 30091412

A Dissertation submitted to
The Tamilnadu Dr. M.G.R. Medical University,
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In partial fulfillment of the requirement for the
Award of the Degree of

MASTER OF SCIENCE IN NURSING

2010

EFFECT OF OIL MASSAGE THERAPY TO LOW BIRTH WEIGHT INFANTS AT SRI RAMAKRISHNA HOSPITAL, COIMBATORE.

1. **Prof. Suganthi A. M. Sc. (N).,**
Head of the Department of Paediatric Nursing,
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences,
Coimbatore - 641 044.

2. **Dr. G.K. Sellakumar, M. A., M. Phil., PGDPM., Ph. D.,**
Professor in Psychology & Research Methodology,
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences,
Coimbatore - 641 044.

3. **Dr. Jaleel Ahamed, M.B.B.S., DCH.,**
Head of the Department of Pediatrics,
Sri Ramakrishna Hospital,
Coimbatore - 641 044.

Certified that this is the bonafide work of

SUGANYA.V

COLLEGE OF NURSING
Sri Ramakrishna Institute of Paramedical Sciences
Coimbatore - 641 044.

Submitted in partial fulfillment of the requirement for the award of the degree of

MASTER OF SCIENCE IN NURSING

to The Tamilnadu Dr. M.G.R. Medical University, Chennai.

College Seal

Prof. (Mrs.) SEETHALAKSHMI,
B.Sc., R.N., R.M., M.N., M. Phil., (Ph. D).,
Principal,
College of Nursing,
Sri Ramakrishna Institute of
Paramedical Sciences,
Coimbatore - 641 044,
Tamilnadu, India.

COLLEGE OF NURSING
Sri Ramakrishna Institute of Paramedical Sciences
Coimbatore.
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Abstract

An interventional study was conducted to identify the effect of oil massage therapy to low birth weight infants at Sri Ramakrishna Hospital, Coimbatore. The study was conducted from 10th May 2010 to 10th June 2010. Quasi Experimental Pretest Post test Control group design was adopted for this study. A purposive sample of 14 infants were selected and assigned randomly to experimental and control groups. The baseline data were collected from the infants record, weight was assessed by electronic weighing scale and neurobehavioral responses was assessed by Modified Brazelton's Neurobehavioral Assessment Scale for both experimental and control groups. Oil massage was implemented with duration of 15 minutes to experimental group 3 times a day in 4 hours interval. Weight was assessed before and after the intervention and neurobehavioral responses was assessed on the first and 10th day of intervention. Weight and neurobehavioral responses of experimental group were compared with control group. The result reveals that there is a significant difference in weight and neurobehavioral responses after oil massage.

Effect of Oil Massage Therapy to Low Birth Weight Infants at Sri Ramakrishna Hospital, Coimbatore.

Low birth weight is the most significant factor contributing to neonatal mortality and morbidity. There is a higher risk of asphyxia, sepsis, hypothermia and feeding problems. Low birth weight infants are more prone to get long term disorders like infection, malnutrition and neurodevelopmental disabilities. The measures to increase the birth weight of babies contribute a priority area in developing nation. Simple measures to prevent mortality and morbidity as care of low birth weight must be exercised with emphasis on skilled attendance at birth, prompt resuscitation, adequate nutrition through breast feeding, prevention of hypothermia and successful referral of sick neonate (Gupta, 2008).

Babies with a birth weight of less than 2.5 kilograms irrespective of the period of gestation are classified as low birth weight babies. These include both preterm and term small for date babies. Low birth weight babies are malnourished during infancy. In India about 22% of babies are of low birth weight. In developed countries, the majority of low birth weight infants are preterm, whereas in developing countries it is reciprocal. In India, majority of new born with low birth weight are full term who are small for gestational age (Kapil, 2009).

A study was conducted to assess the neonatal mortality rate, relationship to birth weight and gestational age. A total of 2063 live birth were studied during one year period. Neonatal mortality rate among low birth weight and preterm was 10.1 and 18.1 percentage respectively. Though, low birth weight babies accounted for 27.8 percentage of live births, they contributed to 79.5 percentage of neonatal deaths.

Similarly preterm babies accounted for 13.2 percentages of live births but contributes to 69.9 percentage of neonatal deaths. Causes of neonatal deaths were birth asphyxia (31.1%), infection (23.3%), immaturity (17.8%), hypothermia (9.65%), hyaline membrane disease (2.7%) and congenital malformation (1.4%). comprehensive antenatal coverage and adequate care followed by optimal management of new born at birth is likely to reduce neonatal mortality rate and improve quality of life (Kaushik, et al., 2008).

The new born baby's sense of touch, temperature and pressure are well developed. The major methods of communication are touch and cry. The neonatal intensive care environment and therapy consists of noxious stimuli and the neonate may develop aversion to touch. Soothing is necessary and should be provided by professionals (Pilliteri, 2003).

Alternative therapy implies outside or apart from biomedicine and is best reserved for the therapy's used instead of bio-medical treatment. In the literature, the term alternative therapy has been used to describe many of the popular activities that enhance health including nutrition, exercise, massage, accupressure, relaxation therapy, music therapy, accupuncture and aroma therapy. Because many of these therapies are used as a complement to biomedical treatment. The complementary therapies are raising popularly among people and health care professionals are increasingly being used in palliative care to improve the quality of life. Complementary intervention has a non pharmacological, safe, cost effective and self caring therapy to enhance a sense of relaxation and satisfaction (Nichi, 2002).

Premature babies in Neonatal Intensive Care Unit (NICU) are handled frequently as part of the essential medical and nursing care they need. They often find this type of touch as disturbing and distressing. Stroking or massaging act as a pleasant contact and provides them comfort and love (Moore, 2005).

Infant massage has been shown that, massage therapy alters hormone level in babies and therefore reduces anxiety and stress. Physiological effect of massage includes mobilizing fluids, washing out metabolic waste products that build up in muscle and promotes blood flow. The tactile stimulation can activate nerve fibers carrying touch sensation and the sensory input from those fibers can decrease pain signals to the brain via the gate theory of pain. Oil based substances improve skin barrier function and protect the skin. Massage has been shows to improve thermoregulation.

1.1. NEED FOR THE STUDY

A Study was conducted to assess the predictors of mortality among very low birth weight neonates in India. The objective of the study was to determine the predictors of mortality among very low birth weight neonates admitted over three years was studied. Medical records were reviewed and data was analyzed to determine the predictors of mortality. A total of 260 cases were enrolled, of which a total of 96 babies died. The survival rate was found to increase with increase in birth weight and gestational age. The study concluded that, the predictors of mortality among very low birth weight neonates in India includes maternal bleeding, apnea, low APGAR score, extreme prematurity, neonatal septicemia and shock (Basu, et al., 2008).

A research study on effect of oil massage on growth and neurobehavior in very low birth weight preterm neonate was conducted at department of pediatrics Maulana Azad medical college and Lok Nayak Hospital, New Delhi. The main objective of the study was to find the effect of oil massage on growth and neurobehavior in preterm babies less than 1500 grams. The study summaries that, oil application may have a potential to improve weight among preterm very low birth weight neonates (Aroja, et al., 2005).

Fractionated coconut oil does not oxidize as quickly as other oil. The stabilization quality of the oil is particularly advantageous when used in a warm environment. The main function of the oil is to act as a lubricant, so that, movement over the skin is not abrasive. Stroking the skin without oil causes friction and can stimulate an adverse reaction in babies. Fractionated coconut oil is an ideal medium for massage in the neonatal unit as it is a pure, light non greasy emollient. Coconut oil has not been found to be degraded by phototherapy and there is no substantiation of burning of preterm skin under light or heater after sunflower or fractionated coconut oil application (Bond, 2009).

Medical research has proven that, premature babies when regularly massaged require minimum hospitalization. All newborn shows healthy growth, more weight gain and thrive better if they are massaged well. A good oil massage soothes and calms a baby, helps them to relax and sleep better and makes them more alert during their waking hours. It is a good exercise that promotes motor activity and emotional security in a child besides a healthy body and muscular development (Acharya, 2006).

Another investigation of oil massage in neonates, an open randomized controlled study of coconut oil versus mineral oil conducted by Department of Neonatology, LTM medical college and general hospital at Mumbai. The main objective of the study was conducted to compare the effect of massage with coconut oil versus mineral oil and placebo (powder) on growth velocity and neurobehavior in term and preterm babies. Preterm appropriate for gestational age babies weighing between 1500 to 2000 grams and term babies weighing more than 2500 grams were included. Oil massage was given to the babies from day 2^{nd} of life till discharge and there after by the mother until 31 days of age, 4 times a day. Babies were followed up daily till discharge and every week after discharge for anthropometry. Neurobehavioral outcome was assessed on 7^{th} and 31^{st} day. The study concluded that, a significant greater weight gain velocity in coconut oil massage group as compared to mineral oil massage and placebo in the preterm and term babies groups as compared to the placebo. Preterm infants received coconut oil massage also shows a greater length gain velocity as compared to placebo group. No statistical significant differences was observed in the neurobehavioral assessment between all three groups in term as well as in preterm babies (Sankaranarayan, et al., 2005).

Coconut oil massage causes greater weight gain due to transcutaneous absorption. Coconut oil is a saturated fat, in medium chain triglycerides. The oil is readily absorbed in preterm babies, as the skin is more thin and vascular. The absorbed oil is bio-available to fill nutritional needs. This may result in more weight gain (Soriano, 2001).

Massage has also been shown to help parents bond with their children. Often parent feel helpless when their premature infant are hospitalized. Through massage, parents can begin to connect and communicate with their children (Bond, 2009).

Infant massage therapy is an inexpensive tool that should be utilized as part of the developmental care of the preterm infant. Nurses have been hesitant to begin massage therapy, for fear of over stimulating the infant and because there has been insufficient research to prove its safety. Recent research however shows that, there is a significant benefit of infant massage therapy for outweigh the minimal risks, when infant massage therapy is properly applied to preterm infants, they respond with increased weight, improved developmental score, and earlier discharge from the hospital. Parents of the preterm infant also benefited because infant massage enhances bonding with their child and increases confidence in their parenting skills (Beachy, 2003).

Researcher is interested in care of new born. Nowadays the incidence of low birth weight are more common mainly because of infertility treatment and multiple pregnancy. Researcher identify the need for caring the low birth weight infant. From the above literature support, researcher identified the benefits of oil massage for caring the low birth weight infants to prevent the long term complications like malnutrition and poor development in neurobehavior.

1.2. STATEMENT OF THE PROBLEM

EFFECT OF OIL MASSAGE THERAPY TO LOW BIRTH WEIGHT INFANTS AT SRI RAMAKRISHNA HOSPITAL, COIMBATORE.

1.3. OBJECTIVES

1.3.1. Assessment of weight and neurobehavioral responses among low birth weight infants.

1.3.2. Oil massage therapy to low birth weight infants.

1.3.3. Assessment of weight and neurobehavioral responses of low birth weight infants after oil massage therapy.

1.4. OPERATIONAL DEFINITIONS

1.4.1. Effect

It is a state to increase weight and neurobehavioral responses after oil massage therapy.

1.4.2. Oil Massage Therapy

Application of coconut oil and touching the baby's body gently from head to toe.

1.4.3. Low Birth Weight infants

It refers to the hospitalized infants aged between ten days to three months of life who weigh 1.5 to less than 2.5 kilograms.

1.5. CONCEPTUAL FRAMEWORK

Widenbach Helping Art of Clinical Nursing Theory (1964) was adopted for developing conceptual framework. This theory views nursing as an art based on goal directed care. Widenbach vision of nursing practice closely parallel to the assessment, implementation and evaluation steps of the nursing process.

Widenbach Helping Art of Clinical Nursing Theory consists of three components were

1. Identification
2. Ministration
3. Validation

(i) Identification

Vital parameters of low birth weight infants were identified. Those parameters includes temperature, heart rate, respiratory rate, length, weight, head circumference, chest circumference and neurobehavioral responses for both experimental and control groups. Neurobehavioral responses were identified by using Modified Brazalton's Neurobehavioral Assessment Scale and weight were assessed by using electronic weighing scale. Weight and neurobehavioral responses were assessed before the intervention.

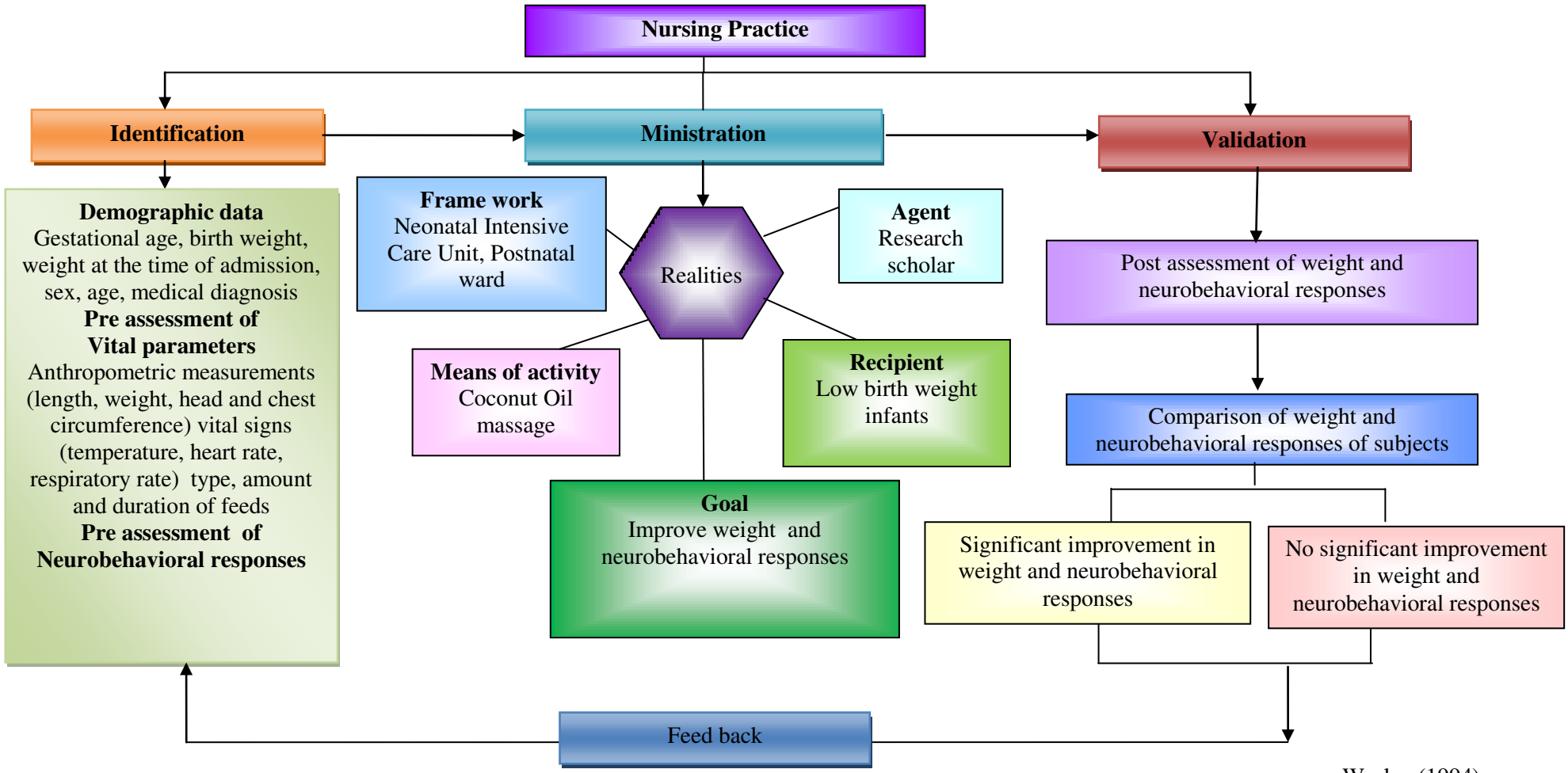
(ii) Ministration

After identification of infants vital parameters, the research scholar facilitated a plan of care to meet the needs. In this study, the researcher applied coconut oil massage therapy for low birth weight infants to experimental group from 10^{th} day of life, three times a day for ten days. Whereas, no oil massage is given to the control group.

(iii)Validation

Researcher assessed the weight before and after each intervention and neurobehavioral responses on first and 10^{th} day of intervention. Weight and neurobehavioral responses were compared between experimental and control groups.

FIG. 1.1.
CONCEPTUAL FRAMEWORK ON MODIFIED WIDENBACH'S HELPING ART OF CLINICAL NURSING THEORY (1964)



Wesley (1994)

1.6. PROJECTED OUTCOME

Application of oil massage among low birth weight infants will improve weight and neurobehavioral responses.

REVIEW OF LITERATURE

The present chapter discusses the literatures related to the present problem of investigation. This was done under the following aspects, literatures related to low birth weight infants, literatures related to oil massage, literatures related to neurobehavioral responses, literatures related to oil massage, weight and neurobehavioral responses.

2.1. LITERATURES RELATED TO LOW BIRTH WEIGHT INFANTS

Low birth weight infants are those who weighs 2500 grams or less at birth regardless of gestational age. Many newborn of low birth weight can be categorized as small for gestational age or small for date babies. Whose birth weight falls below the 10^{th} percentile on intrauterine growth chart. These babies are undernourished for a given gestation. Second category of low birth weight infants include those babies who have born before 37 weeks (preterm). Because birth weight is a function of gestation, a preterm baby is expected to have less weight (Ghai, 2005).

Nutritional requirement of low birth weight is about 180 ml/kg/day (150-200 ml/kg/day). This provides the mean recommended energy intake of 130cal/kg/day. It has been observe that, moderately low birth weight babies thrive and achieve intrauterine weight without any signs of metabolic stress (Ghai, 2005).

The key measure of optimal feeding is the weight pattern of the baby. A low birth weight baby loses up to 1-2 percent weight every day amounting to 10-15 percent cumulative weight loss during the first week of life. Birth weight is regained between 10^{th} – 14^{th} day. All babies start gaining weight by the second week of life at a rate of about 15-20 grams/day. Excessive weight loss or inadequate weight gain

indicates inadequate feeding, cold stress, excessive insensible water loss or systemic illness (Hocken berry, 2005.).

Low birth weight is multifactor in etiology. Nearly 50 risk factors have been evaluated for their role in causing prematurity and intrauterine growth retardation. Some of the critical public health interventions suggested to reduce low birth weight includes, delaying child bearing in adolescent, efforts to improve the nutritional status of women, particularly anemia in pregnancy, especially in undernourished women, malaria prophylaxis or treatment in endemic area, efforts to stop smoking and reduce tobacco chewing, improving female education especially that of mothers. Improvement in sanitation and water supplies and so on (Kapil, 2009).

2.2. LITERATURES RELATED TO OIL MASSAGE

A study on cutaneous application of vegetable oil for better growth of preterm babies. The objective of this study was to examine the effect of cutaneous application of soyabean oil on somatic growth and plasma linolic and arachidonic acid levels in enterally fed preterm infants. This study was included 60 preterm infants born in a hospital Brazil, who were between 28 and 34 weeks of gestation and weighing less than 1700 grams. 12 ml /kg/day of soyabean oil applied 3 times daily by 8 days of life. Anthropometry and lipid analysis were performed. Over a period of 18 months, 31 infants in control group and 29 infants in oil treated group were studied. Changes in weight, length, arm circumference, subscapular skin fold was significantly more in the oil treated group. There was no significant difference in head circumference. Small for gestational age infants changes of these measurements were more as compare to appropriate for gestational age infants. Hence the study concluded that

cutaneous oil application may have a role in growth of preterm babies (Soriano, et al., 2001).

The study was conducted to compare the effect of massage given by mother to those given by trained professionals. Neonates were randomly assigned to a mother massage group, a professional massage group, (or) a control group. In the massage groups, the preterm infant massaged 3 times per day for 15 minutes. The result indicated that both massaged groups gained weight of 26.4 and 28.3 grams/day while the control group gained only 20.5 grams/day. Analysis of this data shows that, there was no significant difference found between the amount of weight gain from the two massage treatment groups (Ferber et al. 2001).

A study conducted to assess the effect of essential fatty acid rich safflower oil and saturated fatty acid profile (coconut oil) of massaged babies at KEM Hospital, Pune. 120 subjects randomly assigned to three oil groups. Subjects were massaged with 5 ml of designated oil for 4 times a day, in 6 hours interval for 5 days, under controlled condition of temperature and feeding. Pre and post oil massage samples of blood were analysed for triglycerides and fatty acid profile using gas chromatography. Post oil triglycerides values were significantly raised in both the oil groups and also in controls. The study results that post oil triglycerides values were significantly higher in oil groups as compared to controls ($p<0.05$). Fatty acid profiles shows significantly rise in essential fatty acids in safflower oil group and coconut oil group. Changes were more evident in term babies. This study concluded that, topically applied oil can be absorbed in neonates and is probably available for nutritional purpose. The fatty acid constituents of the oil can influence the changes in the fatty acid profiles of massaged babies (Kirti.S., 2004).

Another study conducted by Dieter, et al. (2003) on the effect of five days of massage therapy to weight gain and sleep wake behavior of hospitalized stable preterm infant. The study concluded that healthy, low risk preterm infant gained more weight and slept less with first five days of massage.

In different parts of the world, people use various techniques to nurture their young, but a common practice that is often used is touch. The Gujarat in Western India, massage their infants because they believe it increase circulation, cultivating beauty and strong bones. Some British parents massage and rub their infants because they believe it strengthens the mother- child connection. In New Zealand, infant touch is centralized around the knees and ankles to help the child's joints, whereas in Russia, touch is thought to help the development of central nervous system (Barnett, 2005).

Massage increases blood circulation in the body. It also helps in parent – child bonding. As soon as the child is born, the baby needs to spend quality time with his parents. Talking and smiling the baby with massaging keeps a child happy, make the baby more secure (Moore, 2005).

A study conducted to assess the effect of weight gain in infants massaged with oil and without oil. Mothers were trained for massage techniques by the experts, massaged their premature infants for 10 minutes, four times a day for 28 days. In the oil massage group, 10 milliliters of sunflower oil per kilogram of neonates weight. The neonates weight were measured weekly. The result indicated that oil massage group gained more weight (11.6 grams/kg/day) then the regular massage (8.7 grams/kg/day), which behind the additional weight gain, oil massage causes

absorption of oil into the skin and stored in the fat cells without altering the body metabolism (Arora, et al., 2005).

A study was conducted to assess the relationship between vagal tone and weight gain. Data on vagal tone was collected 10 minutes pre and post massage every day. In this study 26 infants were split into either a massage group and control group. The infant in the control group received normal care while the infants in the massage group received 15 minutes massage, 2 times per day for 10 days using the field protocol. The result indicated that, increase in vagal tone after oil massage. The study suggest that, there may be a relationship between the weight gain caused by massage and vagal activity. However, it should be noted that, in the study the massage group did not gain significantly more weight than the control group (Lee, 2005).

A study was conducted by Field, et al. (2006) to assess the effect of moderate versus light pressure massage therapy leads to greater weight gain in preterm infants. The massage was given three times a day for 5 days. In this study behavior state, stress behavior and heart rate were recorded. This study concluded that moderate pressure massage group gained significantly more weight per day. The moderate pressure massage therapy group appeared to be more relaxed and less aroused than the light pressure massage group.

Infant massage is traditionally practiced in parts of Asia and Africa. A typical massage involves gentle touching the baby's body (the pressure applied should be as gentle as touching the body with gentle movement of muscle under the skin surface) from head to the toe while simultaneous talking and responding to the baby (Pushpagiri, 2008).

A study was conducted to assess the effectiveness of coconut oil application reduces transepidermal water loss in preterm very low birth weight neonates at All India Institute of Medical Science, New Delhi. The objective of the study was to determine the efficacy of coconut oil application in reducing transepidermal water loss in preterm very low birth weight neonates. 74 preterm very low birth weight infants were randomly assigned at 12 hours of age to either experimental or control group. 4 ml of topical coconut oil applied for every 12 hours of age and thereafter every 12 hours for 7 days by using vapometer. Coconut oil was applied to experimental group. Transepidermal water loss declined for those in both groups during first week of life, propotional transepidermal water loss in the infant in coconut oil was much greater compared to control group. The study was concluded that coconut oil application in preterm very low birth weight neonate reduces transepidermal water loss by as much as 46 percent, such impact is expected to be of clinical importance, because it could reduce initial water loss, promote better growth and reduce fluid requirement (Sushma, et al. 2008).

A research was conducted on baby massage - A good exercise to relax and make your baby strong. Researcher has concluded that hospitalized infant grow more rapidly when they are correctly massaged. Infant massage provides most of the benefits such as, physical benefits like improve sleep quality, strengthen the nervous system , provide relaxation, strengthen the immune system, reduce muscle tension, support neurological development, relieve emotional distress, speed the process of myelination of the brain and nervous system and increases nutrient and oxygen flow to the cell. Emotional benefits like reduces stress, develop mutual belief and respect.

2.3. LITERATURES RELATED TO NEUROBEHAVIOURAL RESPONSES

Early neonatal examination emphasized neurologic assessment of tone and primitive reflexes. The goal of the neurobehavioral assessment of the preterm infant is to describe the relative maturity of functioning in preterm infant.

The study was conducted to assess the effects of massage on the sympathetic nervous system and the adrenal cortex. 40 infants were divided into a control group and experimental group. The infants in the experimental group were massaged for 30 minutes, 3 times a day, for 10 days using the standard field protocol. Urine sample was collected on the first and last day of the study to test level of norephinephrine and epinephrine. The results revealed that during neonatal massage, catecholamine is associated with stress, one concern might be that, massage would increase the level of stress. The secretion of catecholamine during massage seems to be at the optimal level for development and arousal, but not stress. This improves the infant's level of attention, which in turn helps the development of infant's sympathetic nervous system (Kuhn, et al. 1991).

Kelmonson, et al., (2009) studied the effect of massage on developmental skills in infants born with low birth weight. 40 infants were assigned randomly to experimental and control groups. The infants from the case group were assigned to the massage intervention at the age of 2 months. Infant developmental inventory was used to check infants development in five areas like social, self help, gross motor, fine motor and language skills. The findings were that low birth weight infants who received massage intervention had advanced skills in all 5 areas at the age 3 through 8 months. Revealed association between massage and certain features of advanced

behavioral outcome. Massage can be undertaken to stimulate development in the infant born with low birth weight.

2.4. LITERATURES RELATED TO OIL MASSAGE, WEIGHT AND NEUROBEHAVIOURAL RESPONSES

The study was conducted to address the question of infants stand to benefit the most from massage. In this study, the experimental group received 15 minutes massage, Three times a day for ten days. Whereas on average, the experimental group gained more weight than the control group. Further analysis revealed that, the massaged infants who gained the most weight were those who previously suffered from more obstetric and perinatal problems than massaged neonates who did not gain as much weight. Massage has been shown to enhance the development of nervous system, it might have contributed to improve their fragile nervous system (Scafidi, et al. 1993)

Some psychologist believes that loving touch during infancy teaches humans love, recognition, and self worth. These outcomes lead to a sense of identity and stability of life for the infant. One hundred percent of the mother who participated in a massage class felt their infants benefitted from the massages and 76.6% felt that the massage had given them confidence in handling their infants (Ademson, 1996).

The study conducted to explore the positive effect of massage on weight gain. Infants in the study met the specific inclusion criteria of weight between 750 to 1600 grams, being between 25 to 34 weeks of gestation, not having been breast fed, and being generally healthy. Infants were massaged for 15 minutes, 3 times each day, 1 hour after being fed. Each massage session consisted of 5 minutes of tactile

stimulation, 5 minutes of kinesthetic stimulation and concluded with another 5 minutes of tactile stimulation. The results shown that, the massage group gained significantly more weight than the control group. This study also explored the sleep behavior of massaged neonates. Sleep habits are important to find development. Being awake more is a sign of positive growth and development. This study shows that in just 5 days massage can promote weight and positively alter the distribution of sleep wake state in neonates (Redzepi, et al., 2007).

The study was conducted in the year 2005-2006 to find out the potential benefits of oil massage on weight and neurobehavioral response of low birth weight babies. Infants in the experimental group received routine nursing care as well as 5 minutes of coconut oil massage twice a day for a period of 5 consecutive days. No significant difference was found in the variables under study such as age, sex, gestational age and apgar, and weight and neurobehavioral responses (Jansi, 2008).

Douret, et al. (2009) studied the effect of multimodal stimulation and cutaneous application of vegetable oils on neonatal development in preterm infants. The study was concluded that the combination of stimulation and application of oil to healthy preterm babies results in enhanced weight gain and neurological development and shorter stay in hospital. The main objective of the study is to assess the effect of multimodel stimulation and cutaneous application of vegetable oil on neonatal development in preterm infants. A randomized controlled trial at tertiary referral centre serving the Poitou-charentes region of France. The main objective was to assess the neurodevelopmental and biological benefits of the simultaneous use of multimodel stimulation and cutaneous application of vegetable oil. 49 low risk

preterm infants was randomly assigned to one of three treatment group. Sensori – tonicomotor touch for 10 days with either sweet almond oil, ISIO4 blended oil, or placebo, normal saline, or to a control group who did not receive any intervention. The study results that the group who received Sesori – Tonicomotor with ISIO4 oil demonstrated enhanced weight gain (±57%, 95%) compared with controls. All Sensori – Tonicomotor group shows shortened admission time and an increase in body length.

The study conducted by researchers from the Touch Research Institute at the University of Miami School of Medicine. The main objective of the study was to assess the effect of oil massage on growth and neurobehavior in preterm babies less than 1500 grams. Neonates with birth weight less than 1500 grams, gestation less than 37 weeks, receiving enteral feeds of at least 100 ml /kg/day and less than 10 days of age. Eligible neonates were randomized to one the three groups like massage with oil massage without oil and no massage. Weight, length, head circumference and triceps skin fold thickness were measured in the three groups at regular intervals. Serum triglycerides levels were measured at enrolment and at completion. Neurorobehavior using Brazelton's Neonatal Behavioral Assessment Scale was assessed at enrolment and after 10 days of intervention. The study results that weight gain in the oil massage group (365.8±165.2 grams) was higher compare to the only massage group (290±150.2 grams) and no massage group (285±170.4 grams). The differences in the other anthropometric parameters was not statistically significant. Serum triglycerides and neonatal neurobehavior were comparable in three groups. This study concluded that oil application have a potential to improve weight among preterm very low birth weight neonates.

METHODOLOGY

The present study was designed to assess the effectiveness of oil massage on weight and neurobehavioral responses of low birth weight infants. The methodology adopted for the present study includes research design, setting, population, criteria for sample selection, variables of the study, materials for data collection, hypotheses, pilot study, main study and technique of data analysis and interpretation.

3.1. RESEARCH DESIGN

The research design adopted for the study was Quasi Experimental Design- Pretest- Post Test Control Group Design. Selected sample of low birth weight infants were randomly allocated to experimental and control groups. Weight and neurobehavioral responses of low birth weight infants were assessed before and after oil massage therapy.

3.2. SETTING

The Neonatal Intensive Care Unit of Sri Ramakrishna Hospital has total bed strength of 30 and postnatal ward comprises of 30 beds. Neonatal Intensive Care Unit and Postnatal Ward of Sri Ramakrishna Hospital, Coimbatore, Tamil Nadu was the setting of the study.

3.3. POPULATION

The population for the present study was all hospitalized low birth weight infants aged between 10 days to 3 months of life.

3.4. CRITERIA FOR SAMPLE SELECTION

3.4.1. Inclusion Criteria

(i) Hospitalized low birth weight infants belong to the age group of ten days of life to 3 months of life who weighs 1.5 – less than 2.5 kg are selected as samples.

3.4.2. Exclusive Criteria

(i) The following subjects are excluded from the study.

1. Babies in mechanical ventilator.
2. Babies with open wound.
3. Babies with infected skin.
4. Babies with bleeding.
5. Babies with critical illness.
6. Babies with fracture.
7. Babies with edema and fever.
8. Babies with congenital anomalies.

3.5. SAMPLING

Purposive sample of fourteen low birth weight infants were drawn as a sample and randomly allocated to experimental and control groups.

3.6. VARIABLES OF THE STUDY

3.6.1. Dependent Variable

Dependent variables in the present study were weight and neurobehavioral responses.

3.6.2. Independent Variable

The independent variable of the study was oil massage.

3.7. MATERIALS

1. Demographic data profile
2. Assessment Parameters
3. Modified Brazelton's Neurobehavioral Assessment Scale (1973).
4. Oil Massage

ADMINISTRATION OF TOOLS

3.7.1. Demographic data profile

Demographic data profile consist of gestational age, gender, age, weight at the time of admission, APGAR score and medical diagnosis.

3.7.2. Assessment parameters

Assessment parameters include vital parameters like temperature, heart rate, respiratory rate. Anthropometric measurements like length, weight, head circumference and chest circumference. Type of feeding includes direct breast feeding, spoon feeding with expressed breast milk and artificial feeding. Amount and number of feeds per day. Intravenous fluid and parentral nutrition.

3.7.3. Modified Brazelton's Neurobehavioral Assessment Scale (Brazelton, 1973)

The neonatal behavioral assessment scale was published in 1973, with revision made in 1984. Brazelton's designed this scale to utilize information obtained from newborn with visual, auditory, and tactile stimulation in order to study a newborn's response to the environment. The scale was modified by the researcher.

Alertness is the orientation, infant responsiveness to a stimulus like turning toward the rattle.

Habituation is the response decrement to the repeated presentation to the stimulus. Hold the rattle 12 inches from the infant shake it briskly. There may be delay and diminution should be considered in scoring.

Movement is a description of the amount of baseline motor activity. Not a judgment of the quality of movement. The items are meant to capture excessive movement during sleep.

General tone means the resistance of part of the body to passive movement. Typically the neonate hold the limbs in flexion, in both prone and supine, and there is mild to moderate resistance to passive extension. When tone is increased, the infant hold the limbs tightly in flexion or extends the limbs stifly, strongly resisting your attempts to reposition them.

Skin color is likely to demonstrate mild color changes several times after massaging, the length of time after undressing before the infant begins to change color is a good way to judge color changes. Acrocyanosis is more than mild, localized cyanosis of the extremities and around the mouth. Pale dusky color, lack of color, or grayish color. This should be checked when unusual or excessive. Reddening is more than mild or localized reddening in the extremities or on the body or when the infant is not under enough stress to account for the change.

Self quieting activity that the infant initiates in a crying or fussy state as an observable effort to quiet themself. The success of the activity is measured by an observable state change and persisting for at least 5 seconds.

Consolability is measured after the infant has been crying actively for 15 seconds and measures the number of maneuvers. Some infants will quiet only when they are dressed and left alone. Others will console only when they are hold and actively rocked. A steady hand on a crying infant's belly will act as a soothing stimulus. A few infants may quiet to voice or face. Cuddle in arm is a measure of the infant's response to being held in alert state. Infant is being held in a cuddled position both horizontally against your chest and vertically on your shoulder. The infant's resistance to cuddling should be assessed as well as the ability to relax or mold.

Cuddliness is the measures of the infant response to being held in alerts state. Infants being held in cuddled position both horizontally against chest for 10 seconds. Response is recorded.

Hand to mouth reflex is inborn and seems to be a response to stroking the cheek or the palm of the infant's hand. It can be triggered in the infant by mucus and gagging or by discomfort as the places the infant in prone. It is seen spontaneously as the infant attempt to control or comfort him/herself when upset. Some infants bring their hands to their mouth repeatedly. Insert a part of the fist or fingers and suck actively on the inserted part.

Tremors are a quivering of the infant's limbs and chin are seen. It may indicate central nervous system irritation and also be a sign of immaturity

Crawling and head raise in prone, place head in midline and arm near the head, palms down, observe for 30 seconds. If the infant does not crawl spontaneously, stimulate by gently pressing your palms on the soles of the feet to elicit the response.

Head raise in prone position, place infant in prone, place head in midline and arms near the head, palms down. Observe for 30 seconds.

Posture, the infant preferred posture at rest reflects total body muscle tone. It helps to measure the maturity of an infant. Unwrap and undress the infant and place in the supine position with head in midline. Allow the infant up to 1 minute to settle into a relaxed or preferred position. Even a brief postural adjustment is scored.

Squire window, flex the hand at the wrist, exert pressure sufficient to get as much flexion as possible. The angle between the hypothenar eminence and the anterior aspect of the fore arm is measured and scored.

Arm recoil, hold the infant arm at the wrist and fully flex the arm at the elbow. Extend forearm and release one arm with in one second other arm one second later. Observe the speed and amount of recoil.

Poplitial angle is measured by, place infant in supine position, unwrap one side of diaper with the pelvis flat on the examination table, thigh is held on the infant abdomen in the knee chest position with the knee fully flexed. Grasp the foot at the sides with one hand. Use the other hand to support the side of the thigh without exerting pressure on the arm strings. Extend the leg until a resistance to extension is felt. The angle formed at the knee by the upper and lower leg is measured.

Scarf sign is measured by placing the infants arm just above the chest with one hand. Place your other hand on infant's trunk to prevent trunk rotation, your thumb on the infants elbow. Gently push the elbow across the neck like a scarf. Look for resistance to extension of the shoulder girdle flexor muscle.

Heel to ear maneuver, with the infant supine, hold the infant's foot with one hand and move it as near to the head as possible without forcing it. Keep the pelvis flat on the examining surface.

Rooting reflex, stroke the perioral skin at the corner of the mouth. The infant should turn his or her head towards the stimulated side and try to suck.

Sucking reflex can be elicited by placing clean finger 3 or 4 cm in to infant's mouth with the nail towards the tongue. You should feel rhythemical sucking movement that include stripping action of the tongue forcing upward and back with suction.

Palmar grasp can be elicited by, placing one finger in the infant's hand and press the palmar surface without touching the back of the hand. The infant's finger should flex and close around your finger.

Plantar grasp can be assessed by pressing thumb against the ball of the infant's foot. The infant's should respond with plantar flexion of all toes.

Babinski reflex starts from the toes and scratches the lateral sides of the infant foot towards the heel with the thumb nail. Look for extension of big toes and spreading of the smaller toes.

Tonic neck reflex can be elicited by, turning the infant's face slowly to one side and hold briefly in that position with the jaw over the shoulder. Wait for the infant to make a relaxed postural adjustment and to settle. Look for extension of the arm and leg on the same side and flexion of the elbow on the opposite side.

Moro reflex, hold the infant in supine position in your hands with one hand under the head and other hand supporting the back and buttocks. The infant should be in a symmetrical position with head in midline and arm in front, drop the head for a few centimeters with a sudden and rapid movement. In the complete response there is a abduction of the upper limbs at the shoulder, extension of the forearms at the elbows and extension of the fingers.

Description

The scale consists of 25 items and scores with some responses from 0-3.

Administration of the tool

The infant are stimulated to elicit the response. Responses were assessed and scored.

Scoring

The scoring procedure comprises of 0- No or Mild Response. 1- Moderate Response. 2- Good Response. 3- Very Good Response.

3.7.4. Infant Oil Massage

Infant massage traditionally practiced in part of Asia and Africa. Baby massage offers, parents and caretakers, a way to calm restless babies, stop their cry, help them sleep by using comforting and comfortable touching technique. Massage has been proven, to enhance babies brain development, encourage brighter and happier children with this increasingly popular art.

Preparation of articles

A clean tray containing

1. Soft towel - 2
2. Clean diaper - 1
3. Measuring cup - 1
4. Coconut oil - 5 ml/kg
5. Small bowl - 1
6. Cotton
7. Kidney tray - 1

Preparation of the unit

1. Close the window
2. Switch off the fan
3. Arrange articles near to bed side

Preparation of the baby

1. Informed consent from parents
2. Identify the feeding time
3. Provide comfortable position
4. Remove the cloths
5. Monitor the vital parameters

Procedure

The procedure consist of 3 phase.

Prone position: Massage to be done 12 firm strokes with palm of hands for 5 seconds each in each area as followed.

a) Head- from fore head hairline over scalp down to neck with alternative hands.

b) Neck- from midline outwards with both hand simultaneously.

c) Shoulder- midline outwards with both hand simultaneously.

d) Back- from nape of neck down to buttocks with firm long stroke with Alternative hands.

Supine position: 12 firm stroke in each area as follows

a) Forehead- from midline outward with both hand simultaneously.

b) Cheek- from side to nose with both hands simultaneously in rotating and clockwise direction.

c) Chest- butterfly stroking from midline to upward, outward, downwards and inwards, back to initiating point.

d) Abdomen- from appendix in a clockwise direction around abdomen, avoiding epigastrium and probes with gentle stroke.

e) Upper limb- from shoulder to wrist using alternative hand for stroking.

f) Palms- from wrist to finger tips using alternative hands for stroking.

g) Soles- from heel to tip toe using alternative hands for stroking.

Passive flexion and extension movement of limbs of each large joint (shoulder, elbow, hip, knee, ankle) as five events of 2 seconds in each area.

After care

1. Change the towel
2. Change the baby cloth
3. Monitor the color changes

4. Calm the baby if baby is crying or irritable
5. Monitor the vital signs
6. Check for any discomfort after oil massage therapy

3.8. HYPOTHESES

The following null hypotheses were formulated to test the weight of infants.

H_{01}: There is no significant difference in the weight between experimental and control group before oil massage.

H_{02}: There is a significant difference in the weight between experimental group before and after oil massage.

H_{03}: There is no significant difference in the weight between control group before and after oil massage.

H_{04}: There is a significant difference in the weight between control group and experimental group after oil massage.

H_{05}: There is significant differences in weight between experimental and control groups before and after oil massage.

The following hypotheses were formulated to test the neurobehavioral responses of infants.

H_{06}: There is no significant difference in the neurobehavioral responses between experimental and control group before oil massage.

H_{07}: There is a significant difference in the neurobehavioral responses between experimental group before and after oil massage.

H_{08}: There is no significant difference in the neurobehavioral responses between control group before and after oil massage.

H_{09}: There is a significant difference in the neurobehavioral responses between control group and experimental group after oil massage

H_{10}: There is a significant difference in neurobehavioral responses between experimental and control group before and after oil massage.

3.9. PILOT STUDY

Pilot study was conducted at neonatal intensive care unit and postnatal ward of Sri Ramakrishna Hospital for ten days, in the month of May 2010 with six samples, to find out the feasibility and practicability of the study. The data was collected from infants record. Weight was assessed before oil massage by electronic weighing scale and neurobehavioral responses were assessed by using the Modified Brazelton's Neurobehavioral Assessment Scale and other assessment of anthropometric measurement were done before oil massage. Oil massage was applied to experimental group for 10 days. After ten days of intervention, the same scale were used to assess the weight on daily basis before and after each intervention and neurobehavioral responses and anthropometry were assessed on 10^{th} day. Weight and neurobehavioral responses were compared between experimental and control groups. Hence, the result revealed highly significant weight gain and significant neurobehavioral responses of experimental group after 10 days of intervention. And there is also a significant weight gain and there is no significant development of neurobehavioral responses in control group.

3.10. MAIN STUDY

The main study was conducted from 10^{th} June, 2010 to 10^{th} July, 2010 at Sri Ramakrishna Hospital, Coimbatore. Purposive sample of fourteen infants were selected. The baseline data were obtained from records of the infant. The weight was

assessed by using electronic weighing scale and neurobehavioral response were assessed by using Modified Brazelton's Neurobehavioral Assessment Scale, in both experimental and control group prior to the intervention. Oil massage was applied to experimental group for 10 days. After the intervention weight were recorded on before and after each intervention. The weight and neurobehavioral responses were assessed at the end of intervention in both experimental and control group.

3.11. TECHNIQUES OF DATA ANALYSIS AND INTERPRETATION

Appropriate statistical tool such as descriptive and inferential statistics paired 't' test and unpaired 't' test was used to analyse the data.

DATA ANALYSIS AND INTERPRETATION

This chapter describes the method of analysis and interpretation of the data. The main purpose of this study is to determine the effect of coconut oil massage on low birth weight infants.

The study was conducted at Postnatal ward and Neonatal intensive care unit of Sri Ramakrishna hospital, Coimbatore for 30 days. A total of 14 infants whose weight ranges from 1.5 to less than 2.5 kilograms were included as subjects of both experimental and control groups. The data collected from the infants were tabulated analyzed and interpreted in order to find out the effect of oil massage on low birth weight infants on weight and neurobehavioral responses.

SECTION – I

4.1. BASELINE DATA PRESENTATION

The demographic profile of low birth weight infants were collected in term of gestational age, gender, age, birth weight, weight at the time of admission and medical diagnosis. These data were presented in the form of tables and graphs.

TABLE 4.1
DISTRIBUTION OF DEMOGRAPHIC PROFILE

Demographic variables	Experimental group		Control group	
	No. of infants	Percentage %	No. of infants	Percentage %
Gestational age (in weeks)				
26-30	3	42.9	-	-
31-35	4	57.1	6	85.7
36-40	-	-	1	14.3
Gender				
Male	6	85.7	2	28.6
Female	1	14.3	5	71.4
Birth weight (in gram)				
1500-1699	7	100	2	28.571
1700-1899	-	-	1	14.286
1900-2099	-	-	3	42.857
2100-2299	-	-	1	14.286
2300-2499	-	-	-	-

The above mentioned table portrays that, around 57% of the infants in experimental group were between 31-35 weeks of gestation. In control group around 86% of infants were between 31-35 weeks of gestation.

The table also depict that, around 86% of infants in experimental group were males and 71% in control group were females.

In experimental group all the infants were between 1500-1699 grams of birth weight. In control group around 57% of infants were between 1700- 2099 grams of birth weight.

FIG.NO. 4.1
DISTRIBUTION OF GESTATIONAL AGE IN WEEKS

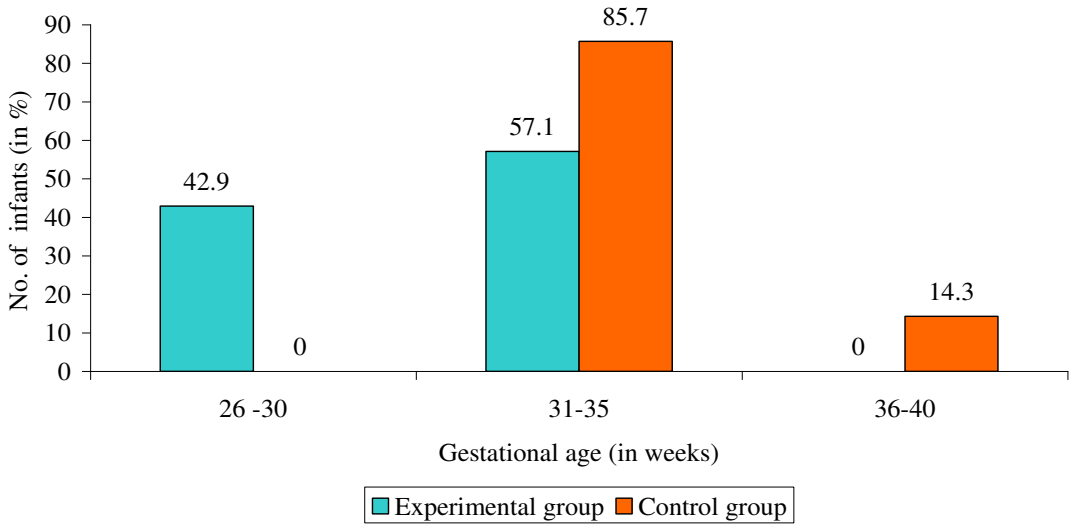
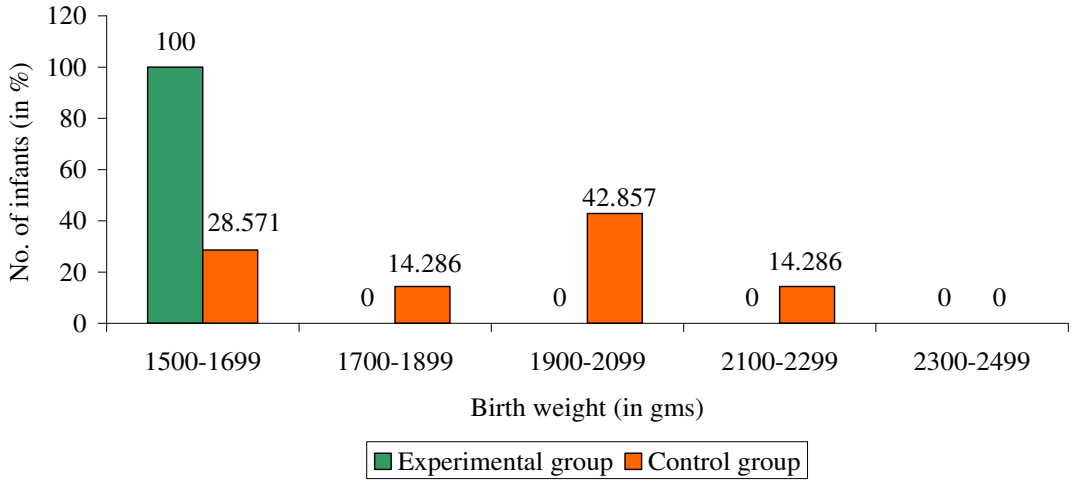


FIG.NO. 4.2
DISTRIBUTION OF BIRTH WEIGHT AMONG LOW BIRTH WEIGHT INFANTS



SECTION – II

4.2. DATA PRESENTATION ON ASSESSMENT PARAMETERS

Assessment parameters include vital parameters, anthropometric measurements, type of feeding, and amount of feeding, intravenous fluids and parental nutrition. Vital parameters in terms of temperature, heart rate and respiratory rate and anthropometric measurement in terms of length, weight, head circumference and chest circumferences were assessed.

TABLE 4.2.
DISTRIBUTION OF INFANTS BY BODY TEMPERATURE

(N=14)

Temperature (in ^{0}F)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
96.1-98	3	42.857	1	14.29	4	57.143	-	-
98.1-100	4	57.143	6	85.71	3	42.857	7	100
Total	7	100	7	100	7	100	7	100

The above mentioned table portrays that, before oil massage around 57% of infants in experimental group had body temperature between 98.1-100^0 Fahrenheit and in control group around 57% of infants had body temperature between 96.1-98^0 Fahrenheit.

In experimental group, around 86% of infants had body temperature between 98.1-100^0 Fahrenheit after oil massage. In control group the body temperature of all the infants were between 98.1-100^0 Fahrenheit after oil massage.

TABLE 4.3.
DISTRIBUTION OF INFANTS BY HEART RATE

(N=14)

Heart rate (beats/ minute)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
101-120	1	14.29	-	-	-	-	-	-
121-140	6	85.71	7	100	7	100	7	100
Total	7	100	7	100	7	100	7	100

The above mentioned table projects that, before oil massage around 86% of infants in experimental group had heart rate between 121-140 beats/minute and in control group all infants had heart rate were between 121-140 beats/minute.

Heart rate of all infants in both experimental and control group after oil massage were between 121-140 beats/minute.

TABLE 4.4.
DISTRIBUTION OF INFANTS BY RESPIRATORY RATE

(N=14)

Respiratory rate (breaths/ minute)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
21-30	2	28.57	4	57.14	-	-	-	-
31-40	5	71.43	3	42.86	7	100	7	100
Total	7	100	7	100	7	100	7	100

The above mentioned table shows that, before oil massage around 71% of infants in experimental group had the respiratory rate between 31-40 breaths/minute. In control group all infants had the respiratory rate between 31-40 breaths/minute.

After oil massage around 57% of infants in experimental group had the respiratory rate between 21-30 breaths/minute and in control group all infants had the respiratory rate between 31-40 breaths/minute.

TABLE 4.5.
DISTRIBUTION OF INFANTS BY LENGTH

(N=14)

Length (in centimeters)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
36-40	1	14.29	1	14.3	-	-	-	-
41-45	6	85.71	5	71.4	5	71.43	3	42.86
46-50	-	-	1	14.3	2	28.57	4	57.14
Total	7	100	7	100	7	100	7	100

The above mentioned table reveals that, before oil massage around 86% of infants in experimental group had length between 41-45 centimeters and in control group around 71% of infants had length were between 41-45 centimeters.

After oil massage around 71% of infants in experimental group had length between 41-45 centimeters and in control group around 57% of infants length were between 46-50 centimeters

TABLE 4.6.
DISTRIBUTION OF INFANTS BY WEIGHT

(N=14)

Weight (in grams)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
1100-1299	3	42.857	-	-	2	28.571	1	14.29
1300-1499	3	42.857	4	57.143	1	14.286	-	-
1500-1699	1	14.286	3	42.857	-	-	2	28.57
1700-1899	-	-	-	-	3	42.857	2	28.57
1900-2099	-	-	-	-	1	14.286	2	28.57
Total	7	100	7	100	7	100	7	100

The above mentioned table projects that, before oil massage around 43% of infants in experimental group had the weight between 1300-1499 grams and in control group around 43% of infants were between 1700-1899 grams.

After oil massage around 57% of infants in experimental group had the weight between 1300-1499 grams and in control group around 29% of infants were between 1900-2099 grams.

TABLE 4.7.
DISTRIBUTION OF INFANTS BY HEAD CIRCUMFERENCE

(N=14)

Head circumference (in centimeters)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
24-25.9	1	14.286	-	-	-	-	-	-
26-27.9	3	42.857	1	14.286	3	42.857	2	28.57
28-29.9	3	42.857	3	42.857	1	14.286	2	28.57
30-31.9	-	-	3	42.857	3	42.857	3	42.86
Total	7	100	7	100	7	100	7	100

The above mentioned table illustrates that, before oil massage around 43% of infants in experimental group had the head circumference between 28-29.9 centimeters and in control group around 43% of infants were between 30-31.9 centimeters.

After oil massage around 43% of infants in experimental group had the head circumference was between 28-29.9 centimeters and in control group around 43% of infants were between 30-31.9 centimeters.

TABLE 4.8.
DISTRIBUTION OF INFANTS BY CHEST CIRCUMFERENCE

(N=14)

Chest circumference (in centimeters)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
21-22.9	2	28.57	-	-	-	-	-	-
23-24.9	4	57.14	4	57.14	3	42.86	1	14.3
25-26.9	1	14.29	1	14.29	2	28.57	4	57.1
27-28.9	-	-	2	28.57	2	28.57	1	14.3
29-30.9	-	-	-	-	-	-	1	14.3
Total	7	100	7	100	7	100	7	100

The above table portrays that, in experimental group around 57% of infants had 23 – 24.9 cm of chest circumference before oil massage and in control group around 43% of infants had 23 – 24.9 cm of chest circumference before oil massage.

After oil massage in experimental group around 57% of infants had 23 -24.9 cm of chest circumferences and in control group around 57% of infants had 23-24.9 centimeters of chest circumferences.

TABLE 4.9.
DISTRIBUTION OF INFANTS BY AMOUNT OF FEEDS

(N=14)

Amount of feeding (in milliliters)	Experimental group				Control group			
	Before		After		Before		After	
	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)	No. of Infants	(%)
210-260	7	100	5	71.429	2	28.571	2	28.571
261-310	-	-	2	28.571	3	42.857	1	14.286
311-360	-	-	-	-	1	14.286	3	42.857
361-410	-	-	-	-	1	14.286	1	14.286
Total	7	100	7	100	7	100	7	100

The above mentioned table represents that, before oil massage in experimental group all the infants were received 210-260 milliliters of expressed breast milk and in control group around 43% of infants were received 261-310 milliliters of expressed breast milk.

After oil massage in experimental group around 71% of infants received 210-260 milliliters of expressed breast milk and in control group around 43% of infants were received 311-360 milliliters of expressed breast milk.

SECTION – III

4.3. ANALYSIS OF THE WEIGHT AND NEUROBEHAVIORAL RESPONSES OF EXPERIMENTAL GROUP AND CONTROL GROUP

't' test for paired and unpaired test were used to analyze the mean difference in the rate of weight gain of both experimental and control group.

TABLE 4.10.
WEIGHT OF EXPERIMENTAL AND CONTROL GROUP BEFORE OIL MASSAGE

(N=14)

Group	Mean	S.D	Mean difference	't'
Experimental	1342.86	100.4514	290.997	0.0171
Control	1632.857	230.3414		

The above table shows the difference between mean, mean %, standard deviation and 't' value of experimental and control group before oil massage.

The 't' value is found to be less than the table value. This reveals that, no significant difference is found in weight between experimental and control group before oil massage. Thus, the hypothesis **''There is no significant differences in the weight between the experimental and control group before oil massage''** is accepted. Hence, the two groups are found to be homogenous.

TABLE4. 11.
WEIGHT OF EXPERIMENTAL GROUP BEFORE AND AFTER OIL MASSAGE

(N =14)

Oil massage	Mean	S.D	Mean difference	't'
Before	1342.86	100.45	168.57	10.1612**
After	1511.43	101.5593		

**** Significance level 0.01**

The above table shows the difference between mean, mean %, standard deviation and 't' value of experimental group before and after oil massage.

The 't' value is found to be greater than the table value. This reveals that a significant difference is found in weight gain of experimental group before and after oil massage. Thus, the hypothesis **''There is a significant differences in the weight between the experimental group before and after oil massage''** is accepted. Hence, the experimental group which was exposed to oil massage shows increases in weight.

TABLE 4.12.
WEIGHT OF CONTROL GROUP BEFORE AND AFTER OIL MASSAGE

(N =14)

Oil massage	Mean	S.D	Mean difference	't'
Before	1632.857	209.4382	42.48296	8.9843**
After	1762.857	251.9212		

**** Significance level 0.01**

The above table shows the difference between mean, mean %, standard deviation and 't' value of control group before and after oil massage.

The 't' value is found to be greater than the table value. This reveals that a significant difference is found in control group before and after oil massage. Thus, the hypothesis **''There is no significant differences in the weight between the control group before and after oil massage''** is rejected. Hence, the changes is observed in the control group may be due to the influence of confounding variables.

TABLE 4.13.
WEIGHT OF CONTROL GROUP AND EXPERIMENTAL GROUP AFTER OIL MASSAGE

(N =14)

Group	Mean	S.D	Mean difference	't'
Control	1764.2857	383.179	252.8576	1.68746
experimental	1511.429	101.559		

The above table shows the difference between mean, mean %, standard deviation and 't' value of control group and experimental group after oil massage.

The 't' value is found to be lesser than the table value. This reveals that, no significant difference is found in weight between control group and experimental group after oil massage. Thus, the hypothesis **''There is a significant differences in the weight between the experimental and control group after oil massage''** is rejected. Hence, both experimental and control group is felt to be increase in weight. Though control group not exposed to oil massage, the other variable such as feeding,

growth, thermoregulation influence the weight. So there was no mean differences were observed between experimental and control groups after oil massage.

TABLE 4.14.
NEURO BEHAVIORAL RESPONSES OF EXPERIMENTAL AND CONTROL GROUP BEFORE OIL MASSAGE

(N=14)

Group	Mean	S.D	Mean difference	't'
Experimental	20.86	2.911	3	1.2882
Control	23.86	5.4292		

The above table shows the difference between mean, mean %, standard deviation and 't' value of experimental and control group before oil massage.

The 't' value is found to be less than the table value. The table indicates that, no significant difference is found in the neurobehavioral responses between experimental and control group before oil massage. Thus, the hypothesis **''There is no significant differences in neurobehavioral responses between the experimental and control group before oil massage''** is accepted. Hence the two groups found to be homogenous.

TABLE 4. 15.
NEURO BEHAVIORAL RESPONSES OF EXPERIMENTAL GROUP BEFORE AND AFTER OIL MASSAGE

(N =14)

Oil massage	Mean	S.D	Mean difference	't'
Before	20.857	2.9114	15.143	6.718**
After	36	5.1640		

**** Significance level 0.01**

The above table shows the difference between mean, mean %, standard deviation and 't' value of experimental group before and after oil massage.

The 't' value is found to be greater than the table value. This reveals that a significant difference is found in neurobehavioral responses of experimental group before and after oil massage. Thus, the hypothesis **''There is a significant differences in the neurobehavioral responses between the experimental group before and after oil massage''** is accepted. Hence, the experimental group which was exposed to oil massage shows improvement in neurobehavioral responses.

TABLE 4. 16.
NEUROBEHAVIORAL RESPONSES OF CONTROL GROUP BEFORE AND AFTER OIL MASSAGE

(N =14)

Oil massage	Mean	S.D	Mean differences	't'
Before	23.86	5.4292	6.14	3.295*
After	30	3.2914		

*** Significance level 0.05**

The above table shows the difference between mean, mean %, standard deviation and 't' value of control group before and after oil massage.

The 't' value is found to be greater than the table value. This reveals that, a significant difference is found in control group before and after oil massage. Thus, the hypothesis **''There is no significant differences in the neurobehavioral responses between the control group before and after the oil massage''** is rejected. Hence, the minimal changes observed in the control group, it may be due to the influence of confounding variables.

TABLE 4.17.
NEUROBEHAVIORAL RESPONSES OF CONTROL GROUP AND EXPERIMENTAL GROUP AFTER OIL MASSAGE

(N =14)

Group	Mean	S.D	Mean difference	't'
Control	30	3.5119	6	2.543*
experimental	36	5.164		

*** Significance level 0.05**

The above table shows the difference between mean, mean %, standard deviation and 't' value of control group and experimental group after oil massage.

The 't' value is found to be greater than the table value. This deals that, a significant difference in neurobehavioral responses is found between control group and experimental group after oil massage. Thus, the hypothesis **''There is a significant differences in the neurobehavioral responses between the experimental and control group after oil massage''** is accepted. Hence, the experimental group which was exposed to oil massage. Though there is a differences observed in control group, which is lesser than the value of experimental group. This result strengthens the interventional effect in the experimental group.

TABLE. 4.18
COMPARISON OF WEIGHT AND NEUROBEHAVIORAL RESPONSES BETWEEN EXPERIMENTAL AND CONTROL GROUP BEFORE AND AFTER OIL MASSAGE

(N= 14)

	Experimental Group						Control Group					
	Before		After				Before		After			
Variables	Mean	S. D	Mean	S. D	Mean Difference	't'	Mean	S. D.	Mean	S. D.	Mean Difference	't'
Weight	1342.86	100.45	1511.43	101.5593	168.57	10.1612**	1632.857	230.3414	1762.857	251.9212	42.48296	8.98**
Neuro behavioral response	20.85	2.9114	36	5.164	15.14	6.72**	23.86	5.43	30	3.29	6.14	3.29**

**** significant at 0.001 level**

14 infants were assigned to experimental and control group. Weight was assessed before and after administration of oil massage by using electronic weighing machine. Paired ‘t’ test was used to prove the significance of this therapy. The weight gain of experimental group before and after oil massage were compared. The mean percentage of experimental group before oil massage was 14.277 and after oil massage the mean percentage was 14.286. The ’t’ value was found to be 10.162. The ’t’ value is found to be greater than the table value.

The weight of control group before and after oil massage. The mean percentage of control group before oil massage was 14.29 and after oil massage the mean percentage was 14.274. The ’t’ value was found to be 6.718. The ’t’ value is found to be greater than the table value.

Comparison of weight between the experimental and control group after oil massage is not significant. Control group infants also shows increases in weight may be due to the influence of confounding variables and also the normal phenomenon of growth. Even though the experimental group exposed to intervention shows more weight gain than the control group.

14 infants were assigned to experimental and control group. Neurobehavioral response score was assessed before and after oil massage by using Modified Brazelton’s Neurobehavioral Response Scale (1973). Paired ‘t’ test was used to prove the significance of this therapy. Neurobehavioral response score of experimental group before and after oil massage were compared. The mean percentage of experimental group before oil massage was 14.29 and after oil massage, the mean

percentage was 14.29. The ’t’ value was found to be 6.718. The ’t’ value is found to be greater than the table value.

The neurobehavioral response score of control group before and after oil massage were compared. The mean percentage of control group before oil massage was 14.29 and after oil massage were 14.29. The ’t’ value was found to be 3.295. The ’t’ value is found to be greater than the table value.

Comparison of neurobehavioral responses of experimental and control group after oil massage is significant. Control group infants also shows development in neurobehavioral responses due to the influence of individual growth pattern. Even though the experimental group exposed to intervention shows more improvement in the neurobehavioral responses than the control group.

RESULTS AND DISCUSSION

The chapter deals with results and discussion of the study. The study was conducted in neonatal intensive care unit and postnatal ward of Sri Ramakrishna Hospital, Coimbatore. The objective of the study was identifying the effect of oil massage on low birth weight infants. Before and after the interventions the weight and neurobehavioral responses were assessed in both experimental and in control group infants. Weight of the subjects was appraised by weighing scale and neurobehavioral responses assessed by using Modified Brazelton's Neurobehavioral Assessment Scale (1973). The experimental low birth weight infants were executed with oil massage thrice a day. The total duration of the intervention in each infant were ten days. Upon tenth day the weight and neurobehavioral responses were checked. The results were compared with both group low birth weight infants.

5.1. FINDINGS RELATED TO BASELINE DATA

5.1.1. Gestational age

Among 14 infants, 21.429% (3) of them were belongs to 26-30 weeks of gestation, 71.229% (10) of the infants were belongs to 31-35 weeks of gestation, 7.142% (1) of the infant were belongs to the gestational age of 36-40 weeks of 36-40 weeks.

5.1.2. Gender

Among 14 infants, 57.1% (8) of infants were males and remaining 42.9% (6) of them were females.

5.1.3. Birth weight

Among 14 infants, 64.29% (9) of the infants had the birth weight of 1500-1699 grams, 7.14% (1) of infant had the birth weight of 1700-1899 grams, 21.43% (3) of them had birth weight of 1900-2099 grams, 7.14% (1) of the infants had birth weight of 2100-2299 grams.

5.2. ANALYSIS OF WEIGHT AND NEUROBEHAVIORAL RESPONSES OF EXPERIMENTAL AND CONTROL GROUP

5.2.1. Assessment of weight of experimental and control group before oil massage

14 infants were randomly assigned to experimental group and control group. The weight was assessed by electronic weighing machine. The mean weight of experimental group was 1342.86 grams. Mean weight of control group was 1632.85 grams. The 't' value was found to be 0.0171. The 't' value is found to be lesser than the table value. Hence, the hypothesis **''There is no significant differences in the weight between the experimental and control group before oil massage''** is accepted. Since the two groups are found to be homogenous.

5.2.2. Assessment of weight of experimental group before and after oil massage

7 infants were assigned to experimental group for oil massage. Weight was assessed before and after oil massage by using electronic weighing machine. The mean weight of experimental group before oil massage was 1342.86 grams after oil massage the mean weight was 1511.43 grams. The 't' value was found to be 10.162. The 't' value is found to be greater than the table value. Hence, the hypothesis **''There is a significant differences between the weight of experimental group before and after oil massage''** is accepted.

Redzepi, et al., (2007) conducted a study to explore the positive effect of massage on weight gain. Infants included in the study, who met the specific inclusion criteria of weight between 750-1600 grams being between 25-34 weeks of gestation. Infants were massaged for 15 minutes three times a day. The study concluded that, the first five days massage can promote weight and positively alter the distribution of sleep wake state in neonates.

5.2.3. Assessment of weight of control group before and after oil massage

7 infants were assigned to control group. Weight was appraised before and after oil massage by using electronic weighing machine. The mean weight of control group before oil massage was 1632.857 grams and after oil massage the mean weight was found to be 1762.857 grams. The 't' value was found to be 8.9843. The 't' value is found to be greater than the table value. Hence, the hypothesis **''There is no significant differences between the weight of control group before and after oil massage''** is rejected. Control group infants were not implemented with oil massage. But, control group infants also gained weight because of influence of confounding variables such as feeding and individual growth pattern.

5.2.4. Assessment of weight of control group and experimental group after oil massage

14 infants were randomly assigned to experimental and control group. The mean weight of control group after oil massage was 1764.2857 grams. The mean weight of experimental group was found to be 1511.429 grams. The 't' value was found to be 1.68746. The 't' value was found to be lesser than the table value. Hence,

the hypothesis **''There is a significant differences between weight of control group and experimental group after oil massage''** is rejected.

The study was conducted by researcher from the touch research institute at the University of miami School of medicine. The main objective of the study was to study the effect of oil massage on growth and neurobehavior among preterm babies less than 1500 grams, gestation less than 37 weeks. The study concluded that, oil massage group (365.8 $\pm$ 165.2 grams) was higher compared to the only massage group (290 $\pm$ 150.2 grams) and no massage group (285 $\pm$170.4 grams). This difference and the differences in the other anthropometric parameters were not statistically significant.

5.2.5. Comparison of weight in control group and experimental group before and after oil massage

14 infants were assigned to experimental and control group. Weight was assessed before and after administration of oil massage by using electronic weighing machine. Paired 't' test was used to prove the significance of this therapy. Table 4.20 and table 4.22 were compared. Table 4.20 depict the weight gain of experimental group before and after oil massage. The mean percentage of experimental group before oil massage was 14.277 and after oil massage the mean percentage was 14.286. The 't' value was found to be 10.162. The 't' value is found to be greater than the table value.

The weight gain of control group before and after oil massage. The mean percentage of control group before oil massage was 14.29 and after oil massage the mean percentage was 14.274. The 't' value was found to be 6.718. The 't' value is found to be greater than the table value. Thus the hypothesis "**there is a significant**

difference in weight between experimental and control group before and after oil massage" is rejected.

5.2.6. Assessment of neurobehavioral response score of experimental and control group before oil massage

14 infants were randomly assigned to experimental group and control group and neurobehavioral response were assessed by using Modified Brazelton's Neurobehavioral Assessment Scale (1973). The mean neurobehavioral responses of experimental group was 20.86 and mean neurobehavioral responses of control group was 23.86. The 't' value was found to be 1.2882. The 't' value is found to be lesser than the table value. Hence, the hypothesis **''There is no significant differences in neurobehavioral responses between the experimental and control group before oil massage''** is accepted. Since the two groups are found to be homogenous.

5.2.7. Assessment of neurobehavioral response score of experimental group before and after oil massage

7 infants were assigned to experimental group. Neurobehavioral responses was assessed before and after oil massage by using Modified Brazelton's Neurobehavioral Assessment Scale (1973). The mean neurobehavioral response score of experimental group before oil massage was 20.857, after oil massage the mean neurobehavioral response score was 36. The 't' value was found to be 6.718. The 't' value is found to be greater than the table value. Hence, the hypothesis **''There is a significant differences in neurobehavioral responses of the experimental group before and after oil massage''** is accepted.

Studies conducted by Kelmonson, et al., (2009) studied the effect of massage on developmental skills in infants born with low birth weight. 40 infants were assigned randomly to experimental and control group. Infant developmental inventory was used to check infant development in five areas like social, self help, gross motor, fine motor and language skills. The study concluded that, low birth weight infants who received massage intervention had advanced skills in all five areas at the age of three through eight months.

5.2.8. Assessment of neurobehavioral response score of control group before and after oil massage

7 infants were assigned to control group. Neurobehavioral response was assessed before and after oil massage by using Modified Brazelton's Neurobehavioral Assessment Scale (1973). The mean neurobehavioral response score of control group before oil massage was 23.86 and after oil massage the mean neurobehavioral response score was 30. The 't' value was found to be 3.295. The 't' value is found to be greater than the table value. Hence, the hypothesis **''There is no significant differences in neurobehavioral responses of the control group before and after oil massage''** is rejected.

5.2.9. Assessment of neurobehavioral response score of control group and experimental group after oil massage

14 infants were randomly assigned to control group and experimental group. The mean neurobehavioral response score of control group after oil massage was 30 and the mean neurobehavioral response score of experimental group after oil massage was 36. The 't' value was found to be 2.543. The 't' value is found to be greater than

the table value. Hence, the hypothesis **''There is a significant differences in neurobehavioral responses of the control group and experimental group after oil massage''** is accepted**.**

Scafidi, et al., (1993) conducted a study to address the question of infant's stands to benefit the most from massage. In this study, the experimental group received 15 minutes massage, 3 times a day for 10 days. The study concluded that, massage has shown to enhance the development of nervous system, it might have contributed to improvement in their fragile nervous system.

5.2.10. Comparison of neurobehavioral responses in control group and experimental group before and after oil massage

14 infants were assigned to experimental and control group. Neurobehavioral response score was assessed before and after oil massage by using Modified Brazelton's Neurobehavioral Assessment Scale (1973). Paired 't' test was used to prove the significance of this therapy. Table 4.21 and table 4.23 were compared. Table 4.21 depict the neurobehavioral response score of experimental group before and after oil massage. The mean percentage of experimental group before oil massage was 14.29 and after oil massage, the mean percentage was 14.29. The 't' value was found to be 6.718. The 't' value is found to be greater than the table value.

The neurobehavioral response score of control group before and after oil massage. The mean percentage of control group before oil massage was 14.29 and after oil massage were 14.29. The 't' value was found to be 3.295. The 't' value is found to be greater than the table value.

Study conducted by Douret, et al., (2009) on the effect of multimodal stimulation and cutanious application of vegetable oil on neonatal development among preterm infants. 40 low risk preterm infants born at 31-34 weeks gestation selected as a samples. Experimental group infants received sensori-tonico motor touch for 10 days with either sweet almond oil, $ISI0_4$ blended oil or placibo or to a control group who did not received any intervention. The study shows that, group who received sensori-tonico motor touch with $ISIO_4$ oil demonstrated enhanced weight gain (+ 57%) compared with control (P=0.030). Both groups of oil massaged babies (almond oil and $ISI0_4$) shows an increased neurological score (P=0.001) compared to controls. The infant receiving $ISIO_4$ oil had an increase in psychomotor scores (P=0.028), time spent in quiet wakefullness (P=0.036), improved orientation (P=0.036) and sensorymotor (P=0.003) systems.

SUMMARY AND CONCLUSION

This chapter summarized the major findings, limitations, implications in the field of nursing education, nursing practice and nursing research.

The study was conducted to identify the effect of oil massage on weight and neurobehavioral responses of low birth weight infants. The study design was used in the study was Quasi Experimental Pretest and Post test Control group design. Total duration of the study was 30 days. Totally 14 hospitalized low birth weight infants were selected as samples. Sample further more classified, seven in experimental group and seven in control group. The study was conducted in Neonatal Intensive Care Unit and Postnatal Ward of Sri Ramakrishna Hospital, Coimbatore. Oil massage was applied to the experimental group. Before and after application of oil massage, the weight and neurobehavioral response were observed for both group by using electronic weighing machine and Modified Brazelton's Neurobehavioral Assessment Scale respectively. At the end of the tenth day the weight and neurobehavioral responses of experimental group compared with control group.

6.1. MAJOR FINDINGS OF THE STUDY

1. Demographic data reveals that, a maximum number of sample is 14 (100%). In that 13 (92.85%) were preterm low birth weight infants.
2. Demographic data shows that, 8 (57.1%) samples were males and 6 (42.9%) were females.
3. Demographic data reveals that, 9 (64.3%) samples had birth weight of 1500-1699 grams.

4. After oil massage, the mean difference of weight gain was found in both the group, in experimental group (168.57 grams) and in control group (42.48 grams). The 't' value was found to be 10.16 in experimental group and 8.98 in control group. No statistically significant difference were identified in weight by comparing experimental and control groups.
5. There is a improvement in neurobehavioral responses in both experimental and in control groups. The mean differences in the control group was 6.14 and in experimental group 15.14. The 't' value in experimental group was found to be 6.72 and in control group 3.29. There was statistically significant differences (P=0.005) observed in neurobehavioral response between experimental and in control group after oil massage.
6. No significant differences in body temperature before and after oil massage in experimental and in control group.
7. No significant differences in heart rate before and after oil massage in experimental and in control group.
8. No significant differences in respiratory rate before and after oil massage in experimental and in control group.
9. Significant differences (P=0.001) was observed in the length of experimental group after oil massage.
10. Significant differences (P=0.001) was observed in the head circumference of both experimental and control group, before and after oil massage.
11. Significant differences (P=0.001) was observed in the chest circumference of both experimental and control group, before and after oil massage.

12. There is a statistically significant differences observed in neurobehavioral responses like alertness, movement, consolability, cuddle in arm, hand to mouth response, tremor, posture, arm recoil, rooting reflex, sucking reflex and palmar grasp in experimental group.

6.2. LIMITATIONS

1. The study was conducted on less number of subjects with minimum period which limits the generalization.
2. Amount of oil observed through the skin is not measurable.

6.3. RECOMMENDATIONS

1. Neonatal intensive care nurses can be trained to implement multi model therapy as a nursing intervention for weight gain and neurobehavioral development.
2. A study conducted to compare the coconut oil versus mineral oil among low birth weight infants.
3. The study can be recommended to perform at community setting.

6.4. SUGGESTIONS

Structured teaching program can be conducted for the staff nurses who are working in the Neonatal Intensive Care Unit and also in Postnatal Ward regarding techniques benefits of using Modified Brazelton's Neurobehavioral assessment scale for assessing the neurobehavioral responses. And applications of oil massage and kinesthetic stimulation for improving weight and neurobehavioral responses.

Mother can be trained for techniques of oil massage.

6.5. IMPLICATIONS

6.3.1. Nursing Education

Nursing curriculum is changing rapidly based on the individual and social needs. Complementary therapy was introduced in the nursing curriculum as a innovative method of caring the patients. Nursing care also concern the holistic care. Holistic nursing care is also includes the complimentary therapy. Among the complimentary therapy, oil massage is practicing from past 100 years and is safe, cost effective and most beneficial. Knowledge must be imported to the students to utilise the complete benefits of massage therapy.

6.3.2. Nursing Practice

Globally about 25 million low birth weight babies are born every year consisting 14% of all live birth, nearly 93% of them in developing country. In India about 28% of live births are low birth weight babies. Low birth weight is one of the most serious challenges, it is mainly associate with mental retardation and high risk of perinatal and infant mortality and morbidity. The infant mortality is about 20 times greater for low birth weight babies than the other babies. Low birth weight was an important guide to the level of care needed for individual babies. Complimentary therapy are widely used to improve the weight. Complimentary treatments are music therapy, oil massage among that oil massage has popular, most beneficial and safe to implement for the newborn. The nurse can practice to manage the low birth weight babies.

6.3.3. Nursing Research

The nursing care is mainly based on evidence based practice. Nursing profession striving to attain and practice their own evidence for improving the nursing profession. The nursing research intended to offer upto date suggestion in proper technique of oil massage as one of the nursing care in improving weight and neurobehavioral responses.

6.6. CONCLUSION

Massage seems to be a promising solution to improve the growth and development of low birth weight infants. It is beneficial in many way, it help infants to reduce stress, increase skin integrity, improve development of central nervous system, shorter hospital stay, gain weight and sleep less. Numerous studies suggests that, massage is safe and beneficial practice. Based on these it is cleared that, infant massage would be a safe, cost effective, easy and beneficial therapy to low birth weight neonates in Neonatal Intensive Care Unit.

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ANNEXURE - I

Paired 't' test

To test the hypotheses, 't' test was applied to findout the significant difference in before and after the oil massage.

$$t = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}}$$

$$SD = \sqrt{\frac{\sum\left(d-\bar{d}\right)^2}{n}}$$

$\bar{d}$ = Mean of difference between pretest and post test score

SD = Standard deviation of the pre-test and post test score

n = Number of samples

ANNEXURE – II

Unpaired 't' test

To test the hypotheses unpaired 't' test was applied to findout the significant difference after oil massage in experimental and control group.

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S}\sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

$$S^2 = \frac{\sum\left(X_1 - \overline{X}_1\right)^2 + \sum\left(X_2 - \overline{X}_2\right)^2}{n_1 + n_2 - 2}$$

Where, $\overline{X}_1$ = mean of the first sample

$\overline{X}_2$ = mean of the second sample

n_1 = number of observation in the first sample

n_2 = number of observation in the second sample

S = Combined standard deviation

APPENDIX – I

From
V. Suganya
II year M.Sc (Nursing),
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences,
Coimbatore -641044.

To
The Dean,
Sri Ramakrishna Hospital,
Coimbatore – 44.

Through
The Principal,
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences,
Coimbatore - 641044.

Respected Sir/Madam,

Sub: Letter requesting permission for conduction the research study

I, V. Suganya doing my M.Sc (Nsg) II year in College of Nursing, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore -641 044, as a part of my curriculum requirement under Dr. M.G. R. Medical University to conduct research, I have selected the research study on **"Application of oil massage on weight and neurobehavioural response of low birth weight neonates in neonatal intensive care unit at Sri Ramakrishna Hospital, Coimbatore".**

I hereby request you to permit me for conduct the research among the neonates during the month of May and June 2010. I assure you that, I will adhere to your rules and regulations. So, kindly do the needful for me. I am grateful to you, when I have been given an opportunity to do my research.

Thanking you

Yours faithfully,

PRINCIPAL
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences
Coimbatore - 641 044.

(V. SUGANYA)

Coimbatore
Date: 21.04.2010

From
V. Suganya
II year M.Sc (Nursing),
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences,
Coimbatore -641044.

To
The Dean,
Sri Ramakrishna Hospital,
Coimbatore – 44.

Through
The Principal,
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences,
Coimbatore - 641044.

Respected Sir/Madam,

Sub: Letter requesting permission for conduction the research study

I, V. Suganya doing my M.Sc (Nsg) II year in College of Nursing, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore -641 044, as a part of my curriculum requirement under Dr. M.G. R. Medical University to conduct research, I have selected the research study on **"Application of oil massage on weight and neurobehavioural response of low birth weight neonates in neonatal intensive care unit at Sri Ramakrishna Hospital, Coimbatore".**

I hereby request you to permit me for conduct the research among the neonates during the month of May and June 2010. I assure you that, I will adhere to your rules and regulations. So, kindly do the needful for me. I am grateful to you, when I have been given an opportunity to do my research.

Thanking you

Yours faithfully,

PRINCIPAL
College of Nursing,
Sri Ramakrishna Institute of Paramedical Sciences
Coimbatore - 641 044.

V. Suganya

(V. SUGANYA)

Coimbatore
Date: 21.04.2010

FORMAT FOR CONTENT VALIDITY

Name of the expert : DR. A M. Jaleel Ahamed

Address : Sri Ramakrishna Hospital

Total content for the tool : Adequate/ Inadequate

Kindly validate each tool and tick wherever applicable.

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Demographic profile				
1.1.	Sample No.		✓		
1.2	Gestational age		✓		
1.3	Gender		✓		
1.4	Age of the low birth weight infant		✓		
1.5	Both weight of low birth weight		✓		
1.6	Weight at the time of admission		✓		
1.7	APGAR score at birth		✓		
1.8	Medical diagnosis		✓		

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Assessment parameters				
2.1.	Vital parameters		✓		
2.2	Anthropomteric measurement		✓		
2.3	Type of feeding		✓		
2.4.	IV Fluids		✓		
2.5.	Total parentral nutrition		✓		

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Modified Brazelton neuro behavioural assessment scale				
3.1.	Alertness		✓		
3.2.	Habituation		✓		
3.3.	Movement		✓		
3.4.	General tone		✓		
3.5.	Skin color		✓		
3.6.	Self quieting		✓		
3.7.	Consolability		✓		
3.8.	Cuddle in arm during stress or cry		✓		
3.9.	Hand to mouth response		✓		
3.10.	Tremulousness		✓		
3.11.	Crawling		✓		
3.12.	Head raise in prone		✓		
3.13.	Posture		✓		
3.14.	Square window		✓		
3.15.	Arm recoil		✓		
3.16.	Popliteal angle		✓		
3.17.	Scarf sign		✓		
3.18.	Heal to ear		✓		

3.19.	Rooting reflex		✓		
3.20.	Sucking reflex		✓		
3.21.	Tonic neck reflex		✓		
3.22.	Palmar Grasp		✓		
3.23.	Plantar Grasp		✓		
3.24.	Babinski Reflex		✓		
3.25.	Moro reflex		✓		

Date: 13/5/18

Signature of the Expert

FORMAT FOR CONTENT VALIDITY

Name of the expert : SHANTHI. P

Address : Vice principal
Institute of Nursing
G.I.C.N.M. Hospital
Coimbatore

Total content for the tool : ✓ Adequate/ Inadequate

Kindly validate each tool and tick wherever applicable.

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Demographic profile	✓			
1.1.	Sample No.				
1.2	Gestational age				
1.3	Gender				
1.4	Age of the low birth weight infant		✓		
1.5	Both weight of low birth weight				
1.6	Weight at the time of admission				
1.7	APGAR score at birth				
1.8	Medical diagnosis				

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Assessment parameters				
2.1.	Vital parameters				
2.2	Anthropomteric measurement				
2.3	Type of feeding		✓		
2.4.	IV Fluids				
2.5.	Total parentral nutrition				

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Modified Brazelton neuro behavioural assessment scale				
3.1.	Alertness				
3.2.	Habituation				
3.3.	Movement				
3.4.	General tone				
3.5.	Skin color				
3.6.	Self quieting				
3.7.	Consolability				
3.8.	Cuddle in arm during stress or cry				
3.9.	Hand to mouth response				
3.10.	Tremulousness				
3.11.	Crawling				
3.12.	Head raise in prone				
3.13.	Posture				
3.14.	Square window				
3.15.	Arm recoil				
3.16.	Popliteal angle				
3.17.	Scarf sign				
3.18.	Heal to ear				

3.19.	Rooting reflex				
3.20.	Sucking reflex				
3.21.	Tonic neck reflex				
3.22.	Palmar Grasp				
3.23.	Plantar Grasp				
3.24.	Babinski Reflex				
3.25.	Moro reflex				

Date: 3/6/20

N.B.

Signature of the Expert

FORMAT FOR CONTENT VALIDITY

Name of the expert :

Address :

Total content for the tool : Adequate/ Inadequate

Kindly validate each tool and tick wherever applicable.

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Demographic profile				
1.1.	Sample No.				
1.2	Gestational age				
1.3	Gender				
1.4	Age of the low birth weight infant		✓		
1.5	Both weight of low birth weight				
1.6	Weight at the time of admission				
1.7	APGAR score at birth				
1.8	Medical diagnosis				

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Assessment parameters				
2.1.	Vital parameters				
2.2	Anthropomteric measurement				
2.3	Type of feeding		✓		
2.4.	IV Fluids				
2.5.	Total parentral nutrition				

Sl. No.	Item	Strongly agree	Agree	Need modification	Remarks
	Modified Brazelton neuro behavioural assessment scale				
3.1.	Alertness				
3.2.	Habituation				
3.3.	Movement				
3.4.	General tone				
3.5.	Skin color		✓		
3.6.	Self quieting				
3.7.	Consolability				
3.8.	Cuddle in arm during stress or cry				
3.9.	Hand to mouth response				
3.10.	Tremulousness				
3.11.	Crawling				
3.12.	Head raise in prone				
3.13.	Posture				
3.14.	Square window				
3.15.	Arm recoil		✓		
3.16.	Popliteal angle				
3.17.	Scarf sign				
3.18.	Heal to ear				

3.19.	Rooting reflex	✓			
3.20.	Sucking reflex				
3.21.	Tonic neck reflex				
3.22.	Palmar Grasp				
3.23.	Plantar Grasp				
3.24.	Babinski Reflex				
3.25.	Moro reflex				

P. Shastri
29/5/10

Date:

Signature of the Expert

APPENDIX - III

SECTION - 1: DEMOGRAPHIC PROFILE

1. Sample No	:	
2. Gestational Age	:	In weeks
3. Gender	:	Male
		Female
4. Age of the Low Birth Weight Infant	:	in days
5. Birth weight of Low Birth weight Infant	:	in Kg
6. Weight at the time of admission	:	in Kg
7. APGAR score at birth	:	out of 10
8. Medical Diagnosis	:	

SECTION – 2: ASSESSMENT PARAMETERS

2.1. Vital Parameters

i .Temperature	:	in farenheat
ii .Heart Rate	:	beats/ min
ii .Respiration	:	breaths/min
iv .Oxygen Saturation	:	

2.2. Anthropometric measurement

i . Length	:	in cm
ii. Weight	:	in kg
iii. Head circumference	:	in cm
iv .Chest circumference	:	in cm

2.3 Type of Feeding

a.	i. Direct Breast Feeding	:	
	ii. Spoon Feeding with expressed breast milk:		
	iii. Artificial Feeding	:	
b.	i. Amount of Feeding	:	in ml/ day
	ii. Number of Feeding	:	per day
3. IV Fluids		:	Yes/ No
If Yes, Specify		:	
Amount		:	in ml/day
4. Total Parentral Nutrition		:	Yes/No
If Yes, Amount		:	in ml/day

SECTION-3
MODIFIED BRAZELTON NEURO BEHAVIORAL ASSESSMENT SCALE

S.NO	ITEMS	0	1	2	3
I-GENERAL ASSESSMENT					
1	Alertness	Never alert	Delayed Response	Moderately Sustain Response	Always alert
2	Habituation	No response	Some response	Moderate response	Good response
3	Movement	No movement	Little movement	Moderate movement	Good movement
4	General Tone	Flaccid	Some Tone	Moderate Tone	Good tone
5	Skin color	pale	Full body blue	Body pink extremity blue	Full body pink
6	Self quieting	Make no Attempts to Quite	Some attempt to Quite	Quite within few seconds	Constantly quite
7	Consolability	Not Consolable	Consolable with Pacifier or Finger to Suck	Consolable by Holding and Rocking	Consolable by hearing voice and seeing Face of Caregiver
8	Cuddle in Arm during stress or cry	Resist Being Held	Some relaxation	Moderate Relaxation	Turns head, fits feet into cavity
9	Hand to mouth response	No attempts to bring hands to mouth	Hand brought to mouth, no insertion	Several insertion with sucking	Sucking for 15 seconds or more exaggerated attempts to get hand in mouth
10	Tremulousness	Continuous Tremors	Tremors after moro response	Tremor during Sleep	No tremor
11	crawling	No crawling response	Weak attempt to crawl	Coordinated crawling	Exaggerated response
12	Head raise in prone	No response	Brief head lift once or twice	Lifting sustained for a few second	Prolonged and exaggerated response

ASSESSMENT OF MATURITY					
13	Posture	Extension of both arms and legs	Legs Flexed Arms Extended	Flexion of legs and some flexion of arms	Flexion of arms and legs
14	Square window	60^0-90^0	30^0-60^0	Less than 30^0	0^0
15	Arm recoil	No recoil	Some Recoil but Slow	Some recoil but fast	Complete Recoil
16	Popliteal angle	180^0 to 160^0	150^0 to 130^0	120^0 to 100^0	90^0 to 60^0
17	Scarf sign	Elbow reaches opposite nipple axillary line	Elbow reaches midline of the chest	Elbow reaches nipple at the same side	Elbow does not reach nipple line
18	Heal to ear	150^0-180^0	120^0-150^0	90^0-120^0	60^0-90^0
REFLEXES					
19	Rooting Reflex	No response	Head turned slowly	Full head turned and grasp with lips	Very vigorous head turned and good sucking
20	Sucking Reflex	No response	Weak suck	Moderate sucking	Good sucking
21	Tonic Neck Reflex	No response	Weak response	Marked response	Exaggerated response
22	Palmar Grasp	No response	Weak grasp	Strong grasp	Very strong grasp
23	Plantar Grasp	No response	Weak flexion of toes	Strong plantar flexion	Very strong flexion
24	Babinski Reflex	No response	Weak extension of toes	Good extension with some flexion of toes	Prolonged response
25	Moro Reflex	No response	Minimal abduction of shoulder and extension of elbow	Adequate abduction of shoulder extension of elbow and low adduction	Adequate abduction adduction and flexion at elbow

INTERPRETATION OF SCORE:
MINIMUM SCORE : 0
MAXIMUM SCORE : 75

First observer Signature:

Second observer Signature:

SECTION-4

CHECK LIST FOR INFANT OIL MASSAGE THERAPY

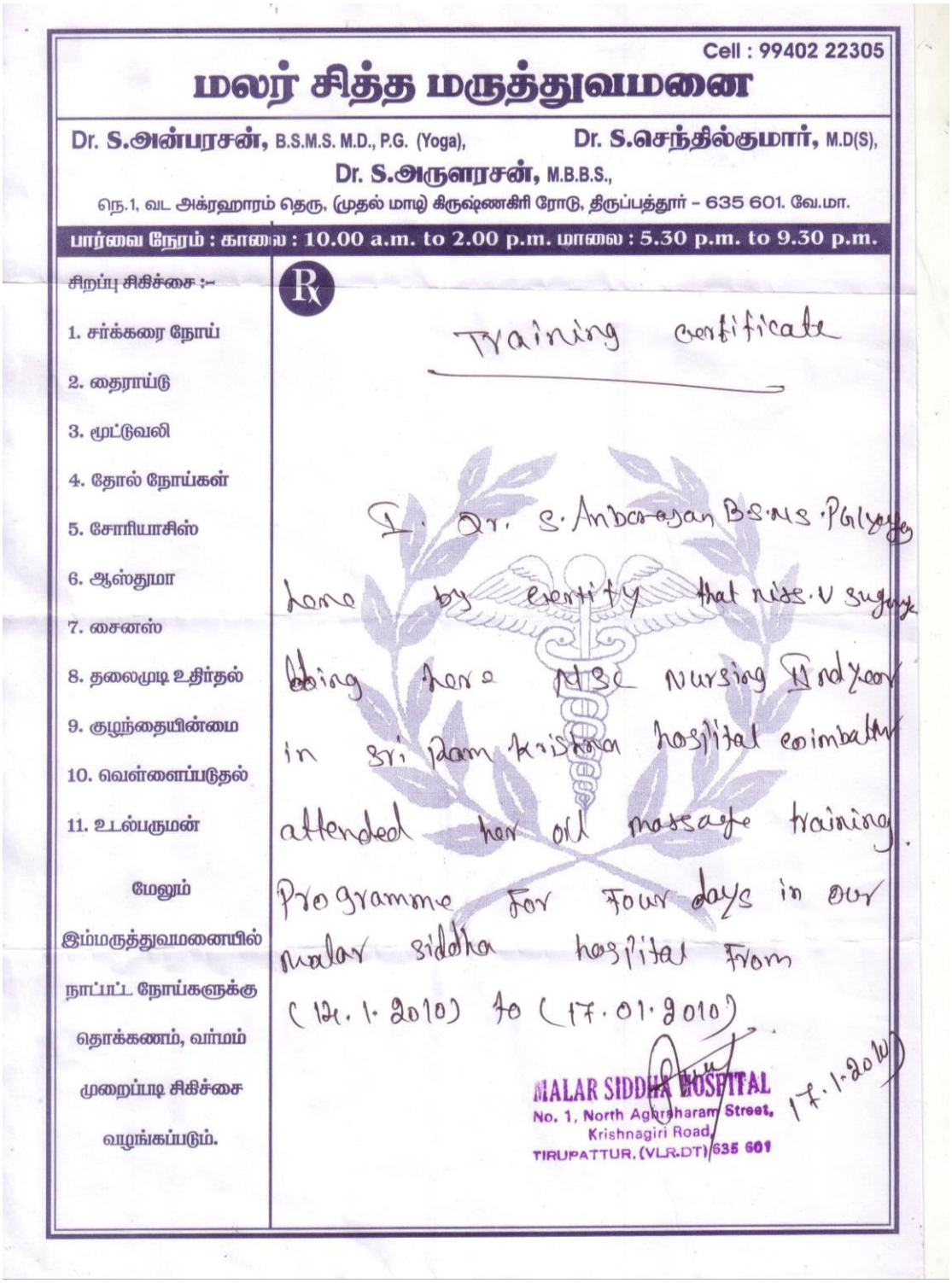
Days	Appraisal of weight before intervention	Appraisal of Neurobehavioral response score before intervention	Vital parameters			Time of last feeding	Sign of the observer		Application of oil massage	Vital parameters after oil massage			Neurobehavioral response score at the end of therapy	Appraisal of the weight after the intervention	Signature of the observer	
			T in F	HR/ Min	RR / Min		I	II		T in F	HR/ Min	RR/ Min			I	II
1																
2																
3																

SECTION-5

COMPARISON OF WEIGHT AND NEUROBEHAVIORAL RESPONSES BETWEEN EXPERIMENTAL GROUP AND CONTROL GROUP AMONG LOW BIRTH WEIGHT INFANTS

	Experimental Group										Control Groups									
DAY	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
SAMPLE																				

APPENDIX - IV



Cell : 99402 22305

மலர் சித்த மருத்துவமனை

Dr. S.அன்பரசன், B.S.M.S. M.D., P.G. (Yoga), Dr. S.செந்தில்குமார், M.D(S),

Dr. S.அருளரசன், M.B.B.S.,

நெ.1, வட அக்ரஹாரம் தெரு, முதல் மாடி கிருஷ்ணகிரி ரோடு, திருப்பத்தூர் - 635 601. வே.மா.

பார்வை நேரம் : காலை : 10.00 a.m. to 2.00 p.m. மாலை : 5.30 p.m. to 9.30 p.m.

சிறப்பு சிகிச்சை :-

1. சர்க்கரை நோய்
2. தைராய்டு
3. மூட்டுவலி
4. தோல் நோய்கள்
5. சோரியாசிஸ்
6. ஆஸ்துமா
7. சைனஸ்
8. தலைமுடி உதிர்தல்
9. குழந்தையின்மை
10. வெள்ளைப்படுதல்
11. உடல்பருமன்

மேலும்

இம்மருத்துவமனையில் நாட்பட்ட நோய்களுக்கு தொக்கணம், வர்மம் முறைப்படி சிகிச்சை வழங்கப்படும்.

℞

Training certificate

I Dr. S. Anbarasan B.S.M.S. Polyage
have by certify that nise. V sugya
doing have a MBC Nursing Indyeon
in Sri Ram Krishna hospital coimbatur
attended her oil massage training
Programme for four days in our
malar siddha hospital from
(14.1.2010) to (17.01.2010)

MALAR SIDDHA HOSPITAL
No. 1, North Agraharam Street,
Krishnagiri Road,
TIRUPATTUR. (VLR.DT) 635 601

17.1.2010

APPENDIX - V

CERTIFICATE OF ENGLISH EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation, "**Effect of Oil Massage Therapy to Low Birth Weight Infants at Sri Ramakrishna Hospital, Coimbatore"** done by **V. Suganya** II year M.Sc Nursing, College of Nursing, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore, has been edited for English language appropriateness.

Name : MRS. ANANDHI. M

Designation : ASST. PROF. AND HEAD

Name of the Institution : SRI RAMAKRISHNA COLLEGE OFARTS AND SCIENCE FOR WOMEN

Signature :

6/1/2011

HEAD
Department of English
Sri Ramakrishna College of Arts &
Science for Women,
Coimbatore - 641 044.